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# Rhodora

JOURNAL OF THE  
NEW ENGLAND BOTANICAL CLUB

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The New England Botanical Club, Inc.

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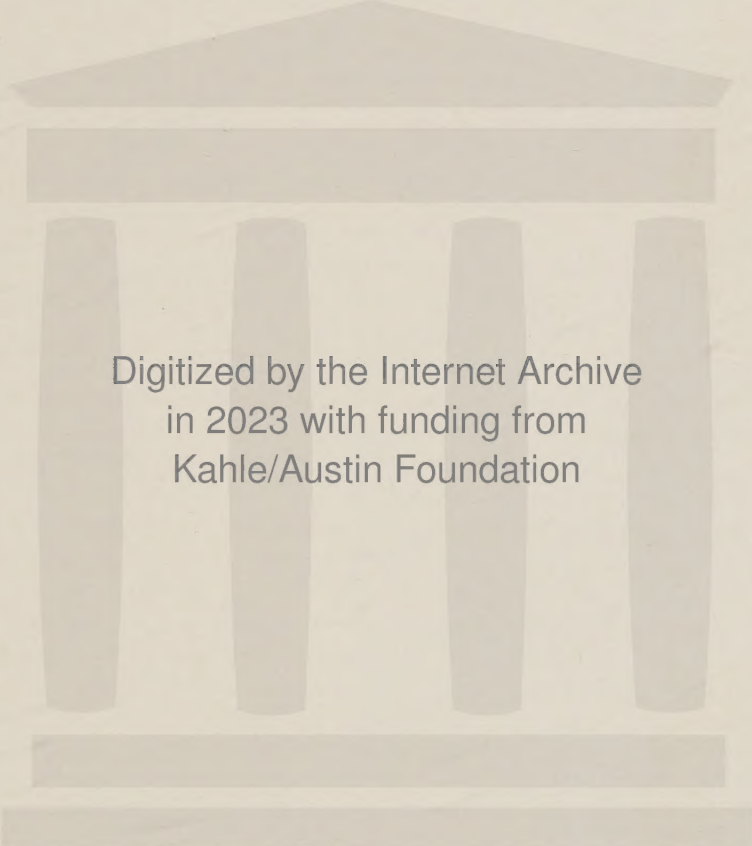
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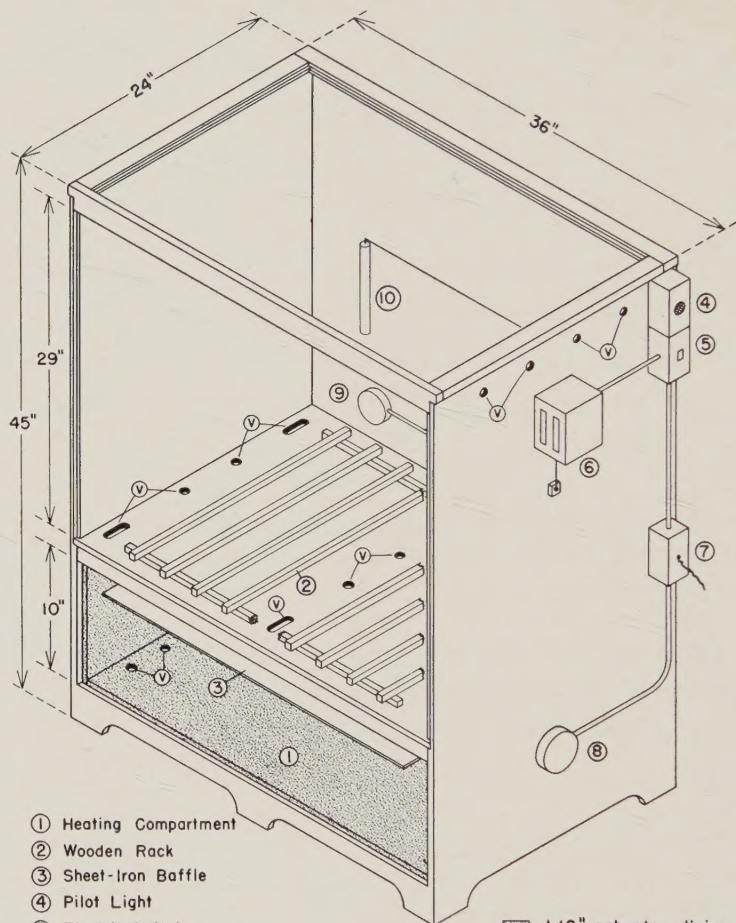
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


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## AN ELECTRICAL DRIER FOR HERBARIUM SPECIMENS



- ① Heating Compartment
- ② Wooden Rack
- ③ Sheet-Iron Baffle
- ④ Pilot Light
- ⑤ Electric Switch
- ⑥ Mercury Thermostat
- ⑦ Outlet Box and Cord
- ⑧ Box to Heating Unit
- ⑨ Firomatic Thermal Switch (connects with ⑦)
- ⑩ Element (connects with ⑥)

 1/2" asbestos lining  
 V Ventilation holes

Full-size doors are required for top, drying-compartment, and heating compartment; walls are 1/2" plywood, 5 ply.

Drawn by Jameson MacFarland  
 Clark University, 1949

# Rhodora

JOURNAL OF

THE NEW ENGLAND BOTANICAL CLUB

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June, 1950

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## AN ELECTRICAL DRIER FOR HERBARIUM SPECIMENS

BURTON N. GATES

CONTRIVANCES of field botanists, with lanterns and oil stoves to supply heat to dry their specimens have been many and various. These devices could not be used safely in a wooden laboratory. Moreover, circumstances at Clark University made it inconvenient to dry specimens out-of-doors, in the presence of sunlight and an abundance of circulating air, which readily carries off the evaporating water from the plants. Drying indoors has been accompanied by discoloration and mildew, most difficult to combat during humid, stagnant periods and at times tediously slow. Working under these conditions, it became increasingly clear that there must be a better and quicker laboratory means for preparing herbarium specimens. Quite naturally it was reasoned, electricity for heat should be adaptable and without a fire hazard.

After consideration with the University electrician and carpenter, of the difficulties to overcome and the results desired to accomplish, they produced an electrical drier. It is essentially a large wooden box (it might well be of insulated metal) with two full-width doors (no hinges) in front and one forming the top. There are two compartments: the one below for the heat-unit (called in the trade a "space-heater"); that above (the larger) for drying two piles of specimens. Between these compartments, the floor is constructed to support at least 250 pounds, allowing for ample pressing weights sometimes amounting to approximately 100 pounds on each pile of specimens. The piles of pressing specimens are elevated on a rack of  $\frac{7}{8}$  inch strips, in order to prevent direct conduction of heat into the piles.

The electrical equipment used for heat is simple, consisting of a space-heating unit with thermostatic control.<sup>1</sup> In addition is a Firomatic Thermal Switch, "T.S.100", which will cut out the current completely in case of overheating due to the failure of the thermostat and in case of fire.

The heating compartment, as a safety measure is insulated with asbestos board. As a further precaution against fire, and also to diffuse the heat generated by the unit, a sheet-iron baffle is suspended above the space-heater. This was found necessary to minimize direct heat-conduction, forming an especially hot-spot in the floor beneath the pressing piles.

Mention of measurements is unnecessary inasmuch as details are shown on the accompanying drawing. The construction may be as simple or as varied as the available materials and the ingenuity of the botanist suggest. Two prime requisites are: absolute safety from fire and reasonable control of the ventilation and the temperature. Also, it is desirable to have ample capacity, with space for at least two pressing-piles, each of at least seventy-five specimens, which should accommodate material of more than one collector.

The circulation of heat is by convection only<sup>2</sup>. Entering the heating chamber from below, the air passes upward through a series of  $\frac{3}{4}$  in. auger holes, together with a few slots of the same diameter. The passages, to allow for the expanding air, increase progressively from the intake to the outlet at the top of the drier. Freedom of convection of air into and from the drying compartment appears particularly important. To increase and facilitate this freedom of passage, it has been suggested that a grating beneath the pressing piles would be preferable to the floor with its ventilating holes and slots as now used. Surely there appears no objection to it, except perhaps that it might be a more costly construction. The efficiency of the apparatus appears to be best, if it is installed in a well ventilated room, relatively free from dampness.

<sup>1</sup> Since there are various temperature-control mechanisms designed to accomplish different results, it is advisable to consult an electrician before purchasing. The controller installed is Minneapolis-Honeywell T415A, with a differential. Set to maintain 110° F., this degree is not exceeded. The differential allows this temperature to drop a few degrees before the current is again cut in and the temperature raised to 110° F.

<sup>2</sup> An electric fan might be installed to advantage, it has been suggested, in order to obtain speedier movement of the vapor-laden air.

For two years since the initial pressing, the apparatus has given outstanding satisfaction. Colors of both chlorophyll-bearing parts and of inflorescences have been retained, drying surprisingly natural and in many instances superb. Aquatics, most ferns, Cariceae and some grasses, among other plants low in water content, have usually dried overnight; material with more water content has required only twenty-four to approximately forty-eight hours. The drying-time is apparently directly related to the water content of specimens, to the texture, to the atmospheric moisture (humidity) and to the temperature and ventilation within the drier.

It is becoming more apparent why some specimens consume more time to dry than others. Recently, it has been observed that fleshy specimens with glaucum appear to be retarded in drying; in growth, glaucum is said to conserve the plant-moisture. In drying *Arisaema atrorubens* (glaucus) and *Arisaema Stewardsonii* (lacking glaucum) in the same pressing, the *A. Stewardsonii* dried promptly and well, while *A. atrorubens* was slow to dry, requiring more attention to prevent discoloration and crinkling. It is pleasing to find that this genus, ordinarily difficult to press without loss of color, may be preserved with nearly complete natural color, together with much of the glaucum of *A. atrorubens*. Success has also been attained in preserving to some extent, the corrugation of the tube of the spadix of *A. stewardsonii*.

Experience has demonstrated the necessity for efficient pressing materials (pads and corrugated pressing-boards or ventilators). *Amelanchier laevis* should press easily and dry quickly with clear white petals and slightly rose-tinted leaves. Difficulty was encountered with a specimen recently taken from the drier; it was of good color and quite satisfactory for about two inches from the margins of the pressing-folder. Inside this area, discoloration increased progressively to the center where there was mold. The pressing-boards or ventilators were old and flattened. Their centers probably trapped and retarded the evaporation of the moisture of the plant juices, encouraging growth of molds. Chemical changes within the plant doubtless took place resulting in discoloration of both leaves and flowers. This experience has demonstrated that a pressing-board uncrushed and in good con-

dition would have successfully liberated the moisture, and permitted even drying.

It is no slight satisfaction to find that it is usually unnecessary to change wet pressing-pads and ventilators. Furthermore, as they come from the drier, they are usually ready for re-use without resorting to prolonged spreading in the sun, airing and drying.

After obtaining conspicuously good results with the thermostatic control set at 110° F. without first having known what the optimum conditions for the job might be, an attempt was made to analyze results, in order to determine whether the methods could be improved. Very little information was discovered in print<sup>3</sup>. Practical collectors, however, were quick to warn against too rapid drying, at too high temperature; no one seemed to know the optimum or the maximum safe temperature. High temperature is said to damage tissues and to shorten the life in the herbarium. It has been stated as the cause of the embrittlement of specimens. Professor Fernald<sup>4</sup> refers to the injury done, in his experience, by drying with extreme heat supplied from an engineroom<sup>5</sup> on shipboard during a collecting excursion. Dr. Karl M. Wiegand, explains Professor Fernald, also devised a drying means above the motor of an automobile<sup>6</sup> which he used while collecting. Each method, it is alleged, resulted in fragile specimens; that is embrittlement. Graphically, Professor Fernald continues to explain that the waxy coating (glaucum) of Dr. Wiegand's *Magnolia virginiana* was melted, completely altering the appearance and obliterating a diagnostic character of the species. Professor Fernald does not indicate the degree of heat utilized, but doubtless it was much higher than he customarily used in pressing.

In an effort to arrive at the normal or perhaps an optimum temperature, the established custom at the Gray Herbarium may

<sup>3</sup> Quite similar in many respects to the electric drier, is the cabinet, seemingly adaptable also to drying specimens, described by Hugh O'Neill, *Rhodora*, 1938, vol. 70, pp. 1-4, illus., titled, "Heat as an Insecticide in the Herbarium" which utilized a temperature of 170° F. with alleged safety. It resulted after 4-6 hours, in a temperature of 140° F. in the center of the bundles being processed.

<sup>4</sup> M. L. Fernald. Injury to Herbarium Specimens by Extreme Heat. *Rhodora*, vol. 47, pp. 258-260.

<sup>5</sup> Engineroom temperatures have been estimated by experienced observers as around 120° F. with a probable reduction of the temperature as the air escapes.

<sup>6</sup> Temperatures over an automobile engine would not normally exceed 140° F. and might be less, depending somewhat on driving conditions and variation of the atmospheric temperature.

be considered. There, as with other collectors, it is accepted practice, to place on end, on the cement sidewalk, in full sun, strapped bundles of specimens prepared between corrugated board ventilators. It has been ascertained<sup>7</sup> that the possible range of temperature in Cambridge, on the cement or stone work in front of the entrance to the Gray Herbarium, on favorable drying days, in full sunlight, may range approximately between 120° and 140° F. This most satisfactory estimate is supported by an observation by the present writer, of surface soil temperature about the crowns of *Sempervivum* growing in a similar situation in Worcester, Massachusetts. In the top half inch of sand, the surface temperature was read at 120° F.

In the drying of plant specimens, a physicist has interpreted a factor, probably quite generally overlooked, but which in reality is the key to the process. Varying with the nature and the bulk of the plant specimens to be dried, is an appreciable amount of water within the tissues. As the water vaporizes, it is picked up and carried off by the air. Almost unbelievable is the physical fact, that one gram of water removed from the specimens, vaporized and expanded, increases in volume one thousand, six hundred times, approximately; that is, a gram of water expands as vapor to about 1.6 liters.<sup>8</sup> The removal of this vast bulk of vaporized water by means of the air is the drying process. Varying with the nature of the material in a given pressing, there may be several grams of water to be picked up and carried off. Obviously, in order to accomplish this readily, the drier should provide free, constant and voluminous passage of air. Conversely, stagnation of the moist, warm air about the succulent plant specimens, in effect slowly cooks them in their own juices and with the accompanying chemical changes, presumably causes discoloration and fading. Such a condition induces and promotes growth of molds, a condition decidedly detrimental to the appearance and life of herbarium specimens. Molds appear to break down the

<sup>7</sup> An appreciated letter, December 30, 1948, from P. H. Kutschenreuter, Meteorologist in Charge, U. S. Weather Station, Logan International Air Field, East Boston, Mass., who interviewed in regard to the problem, Dr. Charles F. Brooks of Harvard University. From his experiments along this line, Dr. Brooks concluded that "under light wind conditions in full sunlight, maximum temperatures on the order of 140° F. were observed; under moderate wind conditions, 120° F." These approximations are of course subject to numerous physical and meteorological phenomena.

<sup>8</sup> Air temperature involves another meteorological axiom. The higher the temperature of the air the greater may be the volume of water-vapor absorbed by it.

plant tissues, being the agent responsible for embrittlement. The sooner, therefore, that the moisture is eliminated, the quicker the drying and the better the resulting specimens. In the construction of the drier, this physical principle of the extraordinary expansion of water, as vapor, should be utilized, with ample provision for the escape of the vapor-laden air.

From the detached data available, as well as by the use of the drier, an approach has been made toward understanding how herbarium specimens may be dried advantageously. An over-high temperature with the consequent over-quick drying and the possible resultant embrittlement of specimens is to be avoided; the over-high temperature it is thought may begin at about 140° F. The electric drier has been operated thus far with much satisfaction at a presumed safe, maximum temperature of 110° F., thermostatically controlled. This may be below the ultimate optimum temperature; near 120° F. is suggested as doubtless safe and very likely efficient. Physical factors point directly to the utilization of as high a temperature as possible. Ideal conditions seem to be temperature and abundant air-circulation as observed out-of-doors in the sun. Outdoor conditions, however, are fluctuating; there are days and circumstances when favorable conditions cannot be available. The electric drier can supplement, if not replace, outdoor drying.

BIOLOGY DEPARTMENT, CLARK UNIVERSITY, Worcester, Massachusetts.

DESMODIUM: PRELIMINARY STUDIES—III<sup>1</sup>BERNICE G. SCHUBERT<sup>2</sup>

IN the preparation of a treatment of the genus *Desmodium* for the eighth edition of Gray's Manual it has been necessary to make certain nomenclatural changes, describe a few previously unrecognized members of the genus and realign some relationships among the North American species. I had hoped by this time to present a comprehensive study of the species of *Desmodium* of the United States and Mexico, but other duties preclude its completion now. This shorter paper, however, the third of the series of Preliminary Studies, will precede by only a brief interval, I trust, the first of the new series of Monographic Studies in *Desmodium*.

Although *Desmodium* was conserved over the name *Meibomia* by the International Botanical Congress of Vienna in 1905,<sup>3</sup> Schindler, in 1934, proposed in his paper "*Desmodium* und *Meibomia*"<sup>4</sup> to maintain both names, assigning to the genus *Meibomia* all the species in the Manual range except *D. nudiflorum*, *D. glutinosum* and *D. pauciflorum*. I shall discuss Schindler's thesis in a later paper, but I do not propose to maintain *Meibomia* as a distinct genus.

For the purpose of seeing more clearly the relationships between species I have arranged them in Series which seem from all observations to be perfectly natural species-groups. The series are described here, but are not in this paper assigned to their respective sections.

## A. MISCELLANEOUS NOTES

## DESMODIUM,

Ser. **Americana**, ser. nov., herbae, ascendentes vel erectae; staminibus monadelphis; lomentorum suturo superiori plus

<sup>1</sup> *Desmodium: Preliminary Studies—I*, in *Contrib. Gray Herb.* cxxix. 3–31 (1940); *Desmodium: Preliminary Studies—II*, op. cit. cxxxv. 78–115 (1941).

<sup>2</sup> I am very grateful to those in charge of the following herbaria for their kindness in making available materials for my study: Chicago Natural History Museum (C); Florida Agricultural Experiment Station, Gainesville (Fla); Missouri Botanical Garden (Mo); New York Botanic Garden (NY); Academy of Natural Sciences, Philadelphia (Phila); U. S. National Herbarium (US). Specimens cited without indication of the herbarium in which they are found are all in the Gray Herbarium.

<sup>3</sup> *Int. Rules of Bot. Nomencl.* 82 (1906).

<sup>4</sup> Schindler in *Rep. Spec. Nov.* xx. 136 (1924).

minusve recto, isthmis angustis, sinibus altis, articulis magnis asymmetricisque.

Ascending or erect herbs; the lomentis with an essentially straight upper suture, narrow isthmi, deep sinuses and large somewhat asymmetrical articles.

*D. glutinosum* (Muhl. ex Willd.) Wood is a representative species and may be taken as the TYPE of the series; the other members are *D. nudiflorum* (L.) DC. and *D. pauciflorum* (Nutt.) DC.<sup>1</sup> In all other series considered in this paper the stamens are diadelphous (9 and 1). This is a very interesting group with its closest relatives in Asia. Our members have always been thought to be confined to the eastern United States (two of them with a few stations in Canada). A single collection by C. G. Pringle from the state of Nuevo Leon in Mexico and recent collections of C. H. Muller, F. G. Meyer & D. J. Rogers, E. Hernandez X. & A. J. Sharp, and Kenoyer & Crum from Nuevo Leon, Puebla and San Luis Potosi, however, add *D. glutinosum* to that already long list of species known in the eastern United States which are found also in Mexico and, in many cases, in Central America.

Ser. **Stipulata**, ser. nov., prostratae vel erectae; stipulis conspicuis, ovato-attenuatis et in basi cordatis vel semicordatis.

These are prostrate or erect herbs with conspicuous ovate-attenuate stipules, cordate or semicordate at the base. *D. canescens* (L.) DC. may be taken as the TYPE-SPECIES.

The related species in the series are *D. illinoense* Gray, *D. rotundifolium* DC. and *D. ochroleucum* M. A. Curtis. The first two species are upright and coarse and rather common in their areas; the latter two are prostrate plants, *D. rotundifolium* more or less widespread, but not abundant and *D. ochroleucum* one of our rarer species of the southeast.

Ser. **Pauciarticulata**, ser. nov., herbae, bracteis floribusque parvis, lomentibus 1-3(-4)-articulatis, articulis parvis vel medio-ocribus.

More or less spreading herbs with small bracts and flowers and few-articulate lomentis with small or medium-sized articles. *D. ciliare* (Muhl. ex Willd.) DC. may be taken as the TYPE-SPECIES.

Other members of the series in our flora are *D. sessilifolium*

<sup>1</sup> This series was defined by Schindler in Rep. Spec. Nov. xxii. 260 (1926). Although he there listed the three American species constituting the group he did not name it.

(Torr.) T. & G., *D. tenuifolium* T. & G., *D. strictum* (Pursh) DC., *D. rigidum* (Ell.) DC., *D. marilandicum* (L.) DC. and *D. lineatum* DC.

Ser. **Longibracteata**, ser. nov., herbae robustae, bracteis primariis magnis conspicuisque, floribus magnis et lomentis brevi-stipitatis.

Stout herbs with long stipules, large conspicuous, but early-deciduous, primary bracts, large flowers and short-stipitate lomentis. *D. canadense* (L.) DC. is a representative species which may be considered the TYPE of the series.

The other member in our flora is *D. cuspidatum* (Muhl. ex Willd.) Loud.

Ser. **Stipitata**, ser. nov., herbae robustae cum bracteis primariis floribusque minoribus et lomentis longiore stipitatis quam in serie precedente.

Usually stout herbs with the primary bracts and the flowers smaller than in the *Longibracteata*, but the lomentis much longer-stipitate.

The series includes some of the most confusing species-complexes in our flora, which are not yet worked out to the author's satisfaction, although in the case of *D. viridiflorum* and its nearest allies the problem seems to be much clarified. *D. viridiflorum* (L.) DC. may be considered the TYPE of the series which also includes from the Manual-range *D. Nuttallii* (Schindl.) Schub., *D. Fernaldii* Schub., *D. glabellum* (Michx.) DC., *D. paniculatum* (L.) DC., *D. perplexum* Schub., *D. humifusum* (Muhl.) Beck and *D. laevigatum* (Nutt.) DC.

The following new applications and nomenclatural changes are necessary but seem to need little discussion beyond their bibliographic records. Since *D. cuspidatum* is being taken up for *D. bracteosum* of ed. 7 rather complete synonymy is given for it as well as for its variety, where an actual nomenclatural change is involved.

**D. GLUTINOSUM** (Muhl. ex Willd.) Wood. The use of this name rather than *D. acuminatum* (Michx.) DC. was discussed by me in RHODORA xlv. 279 (1942). *D. glutinosum* is used rather than *D. grandiflorum* of ed. 7 since the latter was a misapplication. See references to the latter name under *D. cuspidatum* in this paper.

Forma **Chandonnetii** (Lunell) Schub., stat. nov. *Meibomia grandiflora* (Walt.) Ktze., var. *Chandonnetii* Lunell in Am. Midl. Nat. ii. 128 (1911). *D. acuminatum* (Michx.) DC., forma *Chandonnetii* Fassett in RHODORA, xxxviii. 189 (1936).

Forma **unifoliolatum** (Schub.) Schub., comb. nov. *D. acuminatum* (Michx.) DC., forma *unifoliolatum* Schub. in RHODORA, xxxix. 98 (1937).

*D. ROTUNDIFOLIUM* DC., forma **glabratum** (Gray) Schub., stat. nov. Var. *glabratum* Gray, Man. ed. 5, 135 (1867).

*D. CUSPIDATUM* (Muhl. ex Willd.) Loud., Hort. Brit. 309 (1830) [incorrectly attributed to DC.]; Torr. & Gray, Fl. N. Am. i. 360 (1838); Fernald & Schubert in RHODORA l. 203 (1948) [discussion]. *Hedysarum cuspidatum* Muhl. ex Willd., Sp. Pl. iii<sup>2</sup>. 1198 (1802). *D. bracteosum* (Michx.) DC.,  $\beta$ . *cuspidatum* (Muhl. ex Willd.) DC., Prod. ii. 329 (1825). *Meibomia cuspidata* (Muhl. ex Willd.) Schindl. in Rep. Spec. Nov. xx. 140 (1924). *Hedys. bracteosum* Michx. Fl. Bor.-Am. ii. 73 (1803). *D. bracteosum* (Michx.) DC., Prod. ii. 329 (1825); Robinson & Fernald in Gray, Man. ed. 7, 520 (1908); Fassett in RHODORA xxxviii. 96, 97 (1936) et in Legum. Pls. of Wisc. 96 (1939). *M. bracteosa* (Michx.) Ktze., Rev. Gen. i. 195 (1891). *D. bracteatum* Loud., Hort. Brit. 309 (1830) [incorrectly attributed to DC. and undoubtedly referable here]. *Hedys. grandiflorum* Walt. Fl. Carol. 185 (1788) non Pall. 1773. *D. grandiflorum* (Walt.) DC., Prod. ii. 338 (1825). *M. grandiflora* (Walt.) Ktze., Rev. Gen. i. 196 (1891); Blake in Bot. Gaz. lxxviii. 277 (1924) [discussion]; Schindl. in Rep. Spec. Nov. xxii. 276 (1926) [discussion].

There has been considerable changing about of names for this plant but, as shown in the discussion of Walter's plant, *D. cuspidatum* is the name which must be taken up.

Var. **longifolium** (Torr. & Gray) Schub., comb. nov. *D. canadense* (L.) DC.,  $\beta$ . *longifolium* Torr. & Gray, Fl. N. Am. i. 365 (1840). *D. longifolium* Nutt. ex Torr. & Gray, l. c., nomen nudum in synonym.; Smyth in Trans. Kans. Acad. Sci. xvi. 159 (1899). *M. longifolia* (Torr. & Gray) Vail in Bull. Torr. Bot. Cl. xxiii. 140 (1896). *D. bracteosum* (Michx.) DC., var. *longifolium* (Torr. & Gray) Robinson in RHODORA x. 34 (1908); Robinson & Fernald in Gray, Man. ed. 7, 520 (1908); Fassett, Legum. Pls. of Wisc., 96, fig. 49, pl. xii, figs. 62 a-e (1939).

#### B. DESMODIUM VIRIDIFLORUM AND ITS CLOSEST ALLIES

There has been in the past considerable uncertainty concerning some species of *Desmodium* in the southern part of the Manual-range and extending beyond it. Chiefly the misunderstanding has centered on *D. viridiflorum*, a rather close relative described

by Schindler in 1927 as *Meibomia Nuttallii*, *D. rhombifolium* and *D. floridanum* (not yet recorded from the Manual-range). Some of the difficulties were recognized by Torrey and Gray who, however, did not clarify the situation.

In the treatment of the genus prepared for the forthcoming edition of Gray's Manual I am maintaining *D. viridiflorum*, *D. Nuttallii* and *D. laevigatum*, as well as a new species, *D. Fernaldii*, and am treating *D. rhombifolium* as a nomen confusum. I have, fortunately, been able to see type-material or -photographs, or authentic material for all the species involved in this complex. Inasmuch as it has been concerned in questions of identity with species of the Manual-range I am also including *D. floridanum* in this detailed treatment and discussion.

- a. Pedicels mostly short, 3–8.5 mm. long, stout; leaflets densely tomentose to glabrescent beneath (except on veins) but not glaucous.
- b. Leaflets moderately to densely tomentose beneath, soft-velvety to touch; upper surface moderately soft-pilose, not prominently reticulate.
- c. Terminal leaflet usually rhombic to deltoid, acute to cuneate or truncate at base, width generally at least two-thirds the length; articles chiefly rhomboidal (or the upper suture at least somewhat angled).....*D. viridiflorum*.
- c. Terminal leaflet (except the uppermost) elliptic-ovate, mostly rounded at base, width about one-half the length; articles becoming rounded above (*i. e.* the upper suture curved rather than angled).....*D. Nuttallii*.
- b. Leaflets glabrescent to moderately pilose and very strongly reticulate beneath.
- d. Leaves often unifoliolate, at least the terminal leaflet often truncate at base, moderately to abundantly pilose beneath; stipules mostly long-persistent, up to 10 mm. long, stipels up to 5 mm. long; articles large and with the upper suture mostly rounded.....*D. floridanum*.
- d. Leaves trifoliolate, narrowly ovate to rhombic, thick, uncinulate-pubescent along midrib and veins, otherwise essentially glabrous beneath; stipules early deciduous, 2–4 mm. long, stipels to 3 mm. long; articles with the upper suture chiefly angled.....*D. Fernaldii*.
- a. Pedicels longer, 10–19 mm. long, slender; leaflets essentially glabrous to puberulent, glaucous beneath.....*D. laevigatum*.

*D. VIRIDIFLORUM* (L.) DC. Suffrutescent; stem erect, chiefly simple, up to 3 m. high, somewhat ridged and grooved, moderately to sparsely pilose (usually becoming less so in age) and uncinulate-pubescent with downwardly directed trichomes; leaves (rarely uni- to) trifoliolate, stipulate, petiolate; the striate ovate- to lance-acuminate stipules truncate at base, long-attenuate at apex, with the inner surface essentially glabrous to

puberulent and the outer appressed-pilose, 3–7 mm. long; the chiefly linear- to lance-attenuate ciliate stipels puberulent on inner surface, puberulent and somewhat pilose on outer surface, 0.5–4 mm. long; petioles ridged and grooved, spreading-pilose and uncinulate-pubescent, 0.5–6.5 cm. long; leaf-rachis similar, 1.1–2.8 cm. long; the stout petiolules very densely pilose, 3–5 mm. long; leaflets mostly rhombic (the terminal one sometimes deltoid, with truncate base), acute to acuminate or obtuse, width about two-thirds the length, moderately to abundantly spreading-pilose with short straight or hooked hairs (or with both types) and the veins somewhat impressed above, rather densely tomentose with the soft spreading white trichomes denser along midrib and veins beneath; terminal leaflet 5.2–11.8 cm. long, 3.6–8.8 cm. wide; lateral leaflets 4–10.2 cm. long, 2–6.5 cm. wide; inflorescence racemose-paniculate, its rachis prominently ridged and grooved, uncinulate-pubescent; primary bracts ovate-acuminate, striate, pilose on dorsal surface, ciliate, 2–4 mm. long; secondary bracts linear, ciliate, puberulent, not long-persistent, 0.5–1.5 mm. long; pedicels spreading uncinulate-puberulent and somewhat pilose, 3–8 mm. long; calyx patent-pilose throughout, upper bifid lobe 2–3 mm. long, central tooth of lower lobe 2.5–4.5 mm. long, the lateral lobes 2–4 mm. long; corolla said to turn green after anthesis, standard obovate, mostly retuse, cuneate at base, 5–8.5 mm. long, 3.5–8 mm. wide; wings more or less oblong (often somewhat obliquely so), short-clawed, 4.5–8.5 mm. long, 1.5–3 mm. wide; keel-petals falcate, truncate at apex, narrowed to very slender claw, 7–9 mm. long, 1–3 mm. wide above; loment stipitate, mostly (2–)4–5(–6)-articulate; stipe scarcely to moderately uncinulate-puberulent, 3–6 mm. long; articles more or less rhomboidal, moderately to densely uncinulate-pubescent on surfaces and sutures, 5–9 mm. long, 3.5–5 mm. wide.—Prod. ii. 329 (1835), as to name, not as to plant; Beck, Bot. N. and Middle States, 84 (1823) as to plant. *Hedysarum viridiflorum* L., Sp. Pl. 748 (1753). *Meibomia viridiflora* (L.) Ktze., Rev. Gen. i. 197 (1891); emend. Schindl., Rep. Spec. Nov. xxiii. 356 (1927). *Desmodium Torreyanum* Schindl. l. c., nomen nudum in obs.—Chiefly in dry woods and clearings, n. Fla., to e. Tex., n. to Del. and inland only to Ark. and Tenn.

DELAWARE: NEWCASTLE CO.: dry woods, Townsend, Aug. 17, 1911, *J. R. Churchill*.

MARYLAND: NO FURTHER LOCALITY: 1865, *W. M. Canby* ex hb. Boott. KENT CO.: near Chestertown, Aug. 30, 1920. *Will Wallis* (US).

DISTRICT OF COLUMBIA: in vicinis Washington, D. C., Oct. 1, 1882, *L. F. Ward*.

VIRGINIA: NO FURTHER LOCALITY: *Clayton* (hb. Gron. in BM, TYPE; G, phot.). PRINCESS ANNE CO.: dry argillaceous fields and

bushy clearings, Rosemont, Sept. 7, 1935, *Fernald & Long*, no. 4899. NORFOLK CO.: dry open thicket in clay, west of Gertie, June 18, 1935, *Fernald, Griscom & Long*, no. 4660. JAMES CITY CO.: on white oak slopes, n. e. Jones Mill Pond, Williamsburg, Sept. 18, 1920, *E. J. Grimes*, no. 3020. ISLE OF WIGHT CO.: dry woods, James River, northeast of Bartlett, Sept. 18, 1937, *Fernald & Long*, no. 7465; white sand of dry pine barrens, south of Lee's Mill, Aug. 23 & Sept. 2, 1940, *Fernald & Long*, no. 12676. HENRICO CO.: dry oak woods and clearings bordering Whiteoak Swamp, west of Elko Station, Sept. 21, 1938, *Fernald & Long*, no. 9347; dry sandy woods, Elko, Aug. 30, 1925, *Wherry & Pennell*, no. 12497 (Phila.). SOUTHAMPTON CO.: dry sand, pine barrens about 7 mi. south of Franklin, Sept. 7 & 8, 1937, *Fernald & Long*, no. 7464.

NORTH CAROLINA: DURHAM CO.: pine woodland near Durham, Oct. 10, 1938, *R. K. Godfrey*, no. 6703.

SOUTH CAROLINA: NO FURTHER LOCALITY: *M. A. Curtis* (a unifoliolate form, annotated as *D. rhombifolium* by A. M. Vail). BERKELEY CO.: extensive burned-over pineland clearing, near Santee-Cooper Diversion Dam, west of Pineville, Sept. 13, 1939, *Godfrey*, no. 8224.

FLORIDA: DUVAL CO.: (probably from Jacksonville, cf. Hooker, Comp. to Bot. Mag. i. 23 (1835)), *Drummond*; dry pine or oak lands near Jacksonville, fl. Aug. 6, fr. Sept. 15, 1894, *A. H. Curtiss*, no. 4902.

TENNESSEE: COUNTY INDEFINITE: along the French Broad River between Paint Rock and Del Rio, Sept. 1, 1897, *Kearney*, no. 653 (Mo.). MADISON CO.: rich thickets, Jackson, Sept., 1892, *S. M. Bain*, no. 304 (NY).

ALABAMA: NO FURTHER LOCALITY: *Dr. Gates* (NY).

MISSISSIPPI: HANCOCK CO.: in cemetery of Bay St. Louis, Sept. 13, 1883, *Langlois* (NY). WILKINSON CO.: Sept. 9, 1864, *D. L. Phares*, no. 1725 (US, annotated by Schindler as *Meibomia viridiflora*).

ARKANSAS: ST. FRANCIS CO.: Crowley's Ridge, Madison, ca. 65 m. alt., Sept. 3, 1940, *Demaree*, no. 21579. LINCOLN CO.: Yorktown, Bayou Bartholomew, ca. 60 m. alt., Sept. 20, 1936, *Demaree*, no. 13715A. HOWARD CO.: Baker Springs, Oct. 7 and 8, 1909, *J. H. Kellogg* (Mo, 2 sheets).

LOUISIANA: NO FURTHER LOCALITY: *M. A. Curtis* (Mo). CADDO PARISH: Shreveport, Aug. 5, 1847, *Dr. Gregg*, s. n., p. p. (Mo). CALCASIEU PARISH: Sulphur Spring, Oct., 1919, *Arsène*, no. 11343 (US, annotated by Schindler as *Meibomia viridiflora*).

TEXAS: HARRIS CO.: Houston, Sept., 1842, *Lindheimer*. BRAZOS CO.: 2-3 miles east of Koppe Bridge in deep sand in woods, Sept. 13, 1941, *R. G. Reeves*, no. 1095.

The combination *Desmodium viridiflorum* has been generally attributed in manuals and lists to Beck (1833). However, DeCandolle made the same combination in the *Prodromus* (1825) and, although the plant on which he based his combination was not true *H. viridiflorum* L., according to the International Rules of Botanical Nomenclature his combination must be retained.<sup>1</sup> Discussion of the relationship of *D. viridiflorum* and *D. Nuttallii* will follow the latter species.

**D. Nuttallii** (Schindl.), comb. nov. Herbaceous to suffrutescent; stems striate, stout, up to 1.5 m. (Indiana, *Kriebel*), erect or ascending, simple or branched from base, densely to moderately uncinulate-pubescent and somewhat spreading-pilose; leaves chiefly trifoliolate (sometimes unifoliolate at base), stipulate, petiolate; the striate lance- to ovate-acuminate ciliate stipules with truncate base essentially glabrous on inner surface and rather densely appressed-pilose on dorsal surface, not very long-persistent, 3–5.5(–6.5) mm. long; the subulate stipels ciliate and densely white-pilose on outer surface, 1.5–3.5(–4) mm. long; petioles striate, rather densely uncinulate-pubescent and sparsely to densely patent-pilose with long straight trichomes, 0.5–2.5(–3.3) cm. long; the sulcate leaf-rachis exceeding the petiole in length in the upper leaves, 0.4–1.6(–2.3) cm. long; petiolules very densely long-pilose, 1.5–4 mm. long; terminal leaflets ovate to rhombic on upper portions of plant, mostly elliptic-ovate below, with apex acute to obtuse and base mostly rounded (rarely cuneate to truncate), 5.2–10 cm. long, 2.8–5.6 cm. wide; the elliptic to ovate lateral leaflets becoming revolute, moderately appressed pilose above and slightly uncinulate-pubescent near base, rather densely and very softly tomentulose beneath, 3.4–8(–10) cm. long, 2.1–5.1 cm. wide; inflorescence racemose-paniculate, chiefly terminal, rachis uncinulate-pubescent and with occasional spreading pilosity; the mostly ovate-acute striate and ciliate primary bracts puberulent and pilose over dorsal surface, 2–4 mm. long; the lance-ovate secondary bracts ciliate and pilose, 0.5–1.5 mm. long; pedicels uncinulate-pubescent and very finely puberulent, (2.5–)3.5–6.5 mm. long; calyx somewhat pilose throughout but chiefly so along the central portions of the lobes, upper bifid lobe 1.5–2 mm. long, central tooth of lower lobe 2–3.5 mm. long, lateral lobes 1.5–2.5 mm. long; corolla about twice length of calyx; standard obovate, with more or less cuneate

<sup>1</sup> Cf. Art. 54, paragraph 2, emended in *Journ. Bot.* lxxiv, 76 (1936): "'When, on transference to another genus, the specific epithet has been applied erroneously in its new position to a different plant, the new combination must be retained for the plant on which the epithet was originally based, and must be attributed to the author who first published it'".

base, (4-)4.5-6.5 mm. long, 4-5 mm. wide; wings oblong-elliptic or falcate with rounded apex, 4-6 mm. long, 1.5-2.5 mm. wide; keel-petals falcate with truncate apex, abruptly narrowed to a claw one-third the length, (4.5-)5-7 mm. long, 1.5-2 mm. wide above; loment stipitate, 1-4-articulate; stipe 2.5-4 mm. long; articles with rounded upper suture and more or less cuneate lower suture, uncinulate-pubescent throughout, 4-7 mm. long, 3-4.5 mm. wide.—*Meibomia Nuttallii* Schindl., Rep. Spec. Nov. xxiii. 354 (1927). *Desmodium viridiflorum* of many authors, p. p. —Chiefly in dry sandy open woods, N. Y. to Ind., s. to n. Fla., Ala. and Ark.

NEW YORK: KINGS CO.: copse, Brooklyn, Sept. 1, 1842, ex hb. John Carey.

NEW JERSEY: CUMBERLAND CO.: dry sandy open pine and oak woods about 1 mi. w. of Hoffmans Mill, Sept. 1, 1933, Fogg, no. 5980.

PENNSYLVANIA: NORTHAMPTON CO.: Chestnut Hill, Easton, Sept. 5, 1894, T. C. Porter. DELAWARE CO.: dry field, Wayne, Sept. 10, 1910, Bartram, nos. 1158 and 1167.

MARYLAND: BALTIMORE CO.: railroad embankment, Bare Hills, Sept. 15 and 16, 1908, J. R. Churchill (G, 3 sheets).

VIRGINIA: SOUTHAMPTON CO.: dry pine woods west of Adams Grove, Sept. 14, 1937, Fernald & Long, no. 7469; woods, Southampton, Pursh (Phila; G; phot.). FAUQUIER CO.: woods near High Point, above Broad Run Station, western slope of Bull Run Mountains, Sept. 29, 1935, Allard, no. 1027. DINWIDDIE CO.: dry pine and oak woods south of Carson, Sept. 14, 1937, Fernald & Long, no. 7468. BEDFORD CO.: Sept. 1871, A. H. Curtiss. CRAIG CO.: Craig's, 600 m. alt., Aug. 22, 1903, E. S. & Mrs. Steele, no. 72 (US (490070) LECTOTYPE; G, duplicate).

NORTH CAROLINA: NASH CO.: pineland at Middlesex, Oct. 9, 1938, Godfrey & Kerr, no. 6667. WILSON CO.: moist humus soil, recently cleared woodland, 4 mi. se. of Wilson, July 7, 1922, L. F. & F. R. Randolph, no. 718. SAMPSON CO.: pineland near Rosebarn, June 11, 1938, Godfrey, no. 4531. STOKES CO.: Salem, Schweinitz, s. n., p. p. (Phila). BUNCOMBE CO.: dry, open woodlands, Biltmore, Sept. 10, 1898, Biltmore Herb., no. 3788a. SWAIN CO.: woods, ca. 560 m. alt., Aug., 1891, Beardslee & Kofoid.

SOUTH CAROLINA: AIKEN CO.: Aiken, Sept. 24, 1866, Ravenel (G, Mo).

FLORIDA: ALACHUA CO.: on dry cleared scrub-oak land near Hogtown Creek and Newberry Road west of Gainesville, Oct. 17, 1945, West & Arnold, no. 4 (Fla).

INDIANA: BROWN CO.: in partial shade on old field, Cornus Ridge, 5.5 mi. ne. of Nashville, Sept. 18, 1941, Friesner, no. 16419. LAWRENCE CO.: open woods, above Gardner Kaolin Mines, 3.4 mi. sw. of Bryantsville, Sept. 12, 1934, Kriebel, no.

2642. POSEY CO.: in sandy soil on the high bank of Rush Creek in the Dransfield woods about 3 mi. s. of New Harmony, Sept. 22, 1934, *Deam*, no. 55697.

TENNESSEE: KNOX CO.: dry woods along Tennessee River, Knoxville, Oct. 2, 1904, *Ruth*, no. 293.

ALABAMA: LEE CO.: Auburn, *Earle & Baker*.

MISSOURI: MC DONALD CO.: dry ground, Sept. 1, 1893, *Bush*, no. 62 (C, G).

ARKANSAS: woods, nw. Arkansas, *F. L. Harvey*, no. 1. HOWARD CO.: Baker Springs, Oct. 5 and 7, 1909, *J. H. Kellogg* (Mo (1 full sheet and portions of two others)).

*D. Nuttallii* is very closely related to *D. viridiflorum*, but, except for the specimens annotated by Schindler in the United States National Herbarium, seems not to have been taken up, despite the fact that many students have recognized the existence of another element in the material often identified as *D. viridiflorum*. The most outstanding character by which *D. Nuttallii* may be distinguished from *D. viridiflorum* is the curved upper suture which gives the loment-articles a rounded appearance while those of *D. viridiflorum* are more nearly rhombic in outline. In general, the shape of the terminal leaflets as well as the somewhat smaller size of all its parts and its more inland range serve to separate *D. Nuttallii* from its nearest relative.

Since Schindler cited no type (nor, in fact, any specimens) when he described this species I am citing as the LECTOTYPE a specimen from Craig's, Craig County, Virginia, collected by Mr. and Mrs. E. S. Steele, no. 72 (US), which was annotated by Schindler in the course of his studies.

*Desmodium rhombifolium* (Ell.) DC. has been considered an integral part of our more southerly flora for a long period, in spite of the fact that its identity has not ever been completely clear. Torrey & Gray in the Flora of North America considered it identical with *D. laevigatum* and it has more recently been treated as synonymous with *D. floridanum*. Part of the difficulty has arisen through mixed collections, Elliott apparently having distributed specimens as identical, which were unlike that in his own herbarium; and part through some confusion in Elliott's own treatment. The specimen which had been labeled by Elliott as *H. rhombifolium* was photographed for the Gray Herbarium by Mrs. C. A. Weatherby and has recently, through

the kindness of the director, Dr. E. Milby Burton, been lent me for study. At the bottom of the sheet is Elliott's label with the inscription "*H. rhombifolium* mihi" and below it "*oblongifolium* Muhl." In his Flora Elliott describes as new under *Hedysarum ciliare*, a variety—*oblongifolium*, to which I think the second inscription as well as the plant may be referred. Of the identity of Muhlenberg's plant I am not certain but Elliott may well have considered it the same as his new variety. At any rate the specimen, in flower and fruit, though not in good condition, belongs definitely to our series *Pauciarticulata*, which includes also *D. ciliare*, and not to the series *Stipitata* of which *D. floridanum* and the material up to now treated as *D. rhombifolium* are members.

In view of the long period of confusion it seems best to me to place *D. rhombifolium* in the category of a *nomen confusum* and to deal separately with the material identified as that species which is, however, not related to Elliott's plant. The more southern material with persistent stipules and strongly reticulate often unifoliate leaflets is *D. floridanum* Chapm. The other element with early-deciduous stipules and smoother trifoliate leaves I am describing as new and calling *D. Fernaldii*.

**D. FLORIDANUM** Chapm. Herbaceous; the stout, lineate to somewhat ridged and grooved simple (only rarely branched at base) stem, up to 4.5 dm. high excluding inflorescence, mostly uncinulate-pubescent, occasionally also with some long, straight white spreading trichomes interspersed; leaves mostly unifoliate below, trifoliate above, stipulate, petiolate; the lance- to narrowly ovate-attenuate truncate stipules glabrous within, ciliate, puberulent and somewhat pilose on dorsal surface, persistent, 4–10 mm. long; the linear-attenuate to lanceolate stipels finely puberulent with some scattered longer pilosity, persistent, 1.5–5.5 mm. long; the finely ridged and grooved petioles densely to moderately uncinulate-pubescent, with straight white pilosity sparse to moderate, 1.4–3.5 cm. long; leaf-rachis similar or deeply sulcate, usually with less pubescence, 0.6–2 cm. long; the stout petiolules white with spreading pilosity, uncinulate-puberulent, 1–4 mm. long; the leaflets uncinulate-puberulent and soft-pilose with scattered fine straight trichomes beneath and with the venation prominently reticulate; the rhombic to deltoid or ovate terminal leaflet cuneate to truncate or rounded at base, obtuse to acute at apex, 4–9 cm. long, 2–5.4 cm. wide; lateral leaflets mostly similar but smaller, 3–6 cm. long, 1.5–2.7 cm. wide; inflorescence

leafless, racemose-paniculate or frequently unbranched, its rachis finely ridged and grooved, uncinulate-pubescent with finer shorter hairs than on stem; the ovate-acuminate primary bracts truncate to cordate, glabrous within, ciliate, sparsely to moderately straight-pilose and very finely puberulent on the dorsal surface, 2.5–4.5 mm. long; the lanceolate to lingulate secondary bracts ciliate, puberulent and somewhat straight-pilose on dorsal surface, 1–2 mm. long; pedicels very finely uncinulate-puberulent, (4.5–)6–8 mm. long; calyx very finely uncinulate-puberulent with some long, white, straight trichomes chiefly on the teeth of both lobes; upper bifid lobe ca. 2.5 mm. long, central tooth of lower lobe 3–4 mm. long, lateral teeth 2.5–3 mm. long; corolla about twice as long as calyx; standard obovate, 6.5–7 mm. long, 5 mm. wide, wings elliptical to somewhat oblong, short-clawed, 6.5–7 mm. long, 1.5–2.5 mm. wide; keel-petals falcate, long-clawed, 7–7.5 mm. long, 2–2.5 mm. wide; loment stipitate, 3–5-articulate; stipe 1.5–4 mm. long; articles more or less deltoid, curved on dorsal suture, broadly obtuse on ventral suture, uncinulate-pubescent throughout, 6–7 mm. long, 4–5 mm. wide. —Fl. So. U. S. 102 (1860). *Meibomia floridana* (Chapm.) O. Ktze., Rev. Gen. i. 198 (1891). *Meibomia rhombifolia* sensu Vail in Bull. Torr. Bot. Cl. xix. 113 (1892) as to syn. cit. *D. floridanum*. *M. rhombifolia* sensu Schindl. in Rep. Spec. Nov. xxiii. 356 (1927) in obs. p. p. —Dry, sandy pinelands, southern South Carolina, Georgia and Florida.

SOUTH CAROLINA: BEAUFORT CO.: sandy soil, Beaufort, Sept. 5, 1904, *Biltmore Herb.*, no. 3796a (NY). JASPER CO.: sandy open space under pines, 2 miles northeast of Coosawhatchie, July 19, 1927, *Wiegand & Manning*, no. 1597.

GEORGIA: LOWNDES CO.: along the Withlacooche River, near Valdosta, June 6–12, 1895, *Small* (C).

FLORIDA: WITHOUT FURTHER LOCALITY: *G. H. Bates*, 1889 (NY); middle Florida, *Chapman*, no. 122 (NY); no data, "Herb. Chapman, *Desmodium floridanum* S. fl!" (US (55092), annotated by Schindler as *Meibomia rhombifolia*). DUVAL CO.: dry open sandy oak woods, Tisonia, July 27, 1927, *Wiegand & Manning*, no. 1598; dry pine barren, May 28, 1902, *Fredholm*, no. 5254; dry, fertile, pine woods near Jacksonville, Aug. 12, 1896, *A. H. Curtiss*, no. 5717A; dry pine or oak lands near Jacksonville, fl. Aug. 6, fr. Sept. 15, 1894, *A. H. Curtiss*, no. 4902 (G; NY; US, p. p.). ORANGE CO.: Killarney, Aug., 1889, *O. Vesterlund*, no. 26 (US, annotated by Schindler as *Meibomia rhombifolia*). BREVARD CO.: scrub oak land, Okeechobee region, Apr. 6, 1903, *Fredholm*, no. 5765; dry pine lands, Eau Gallie, July 22, 1896, *A. H. Curtiss*, no. 5717 (G; NY). DADE CO.: in pinelands, Ft. Lauderdale, Nov. 19 and 25, 1903, *Small & Carter*, no. 1165 (NY); pinelands south of Miami River, Nov. 26–Dec. 20, 1913, *J. K. & G. K.*

*Small*, no. 4747 (NY). LAKE CO.: high pineland in vicinity of Eustis, May 1–15, 1894, *G. V. Nash*, no. 698 (NY). LEE CO.: along ditches, Myers, July–Aug., 1900, *A. S. Hitchcock*, no. 67. PASCO CO.: in dry pinelands, Lake Jovita, May 15, 1927, *H. O'Neill* (Mo). HILLSBORO CO.: Tampa, Aug., 1898, *A. M. Ferguson* (Mo). FRANKLIN CO.: Apalachicola, ex hb. "Flora of the Southern United States, and Supplement, *A. W. Chapman*, M.D." (US (943841), LECTOTYPE; G, duplicate).

Although Schindler, in his treatment, said that without fruit it was difficult to distinguish *D. viridiflorum*, *D. Nuttallii* and *D. rhombifolium* (including *D. floridanum*), the following characters, in addition to strong differences in habit and shape and pubescence of leaflets, will serve to separate *D. floridanum* from *D. viridiflorum*:

	D. FLORIDANUM	D. VIRIDIFLORUM
BRACTS	Only sparsely to moderately pilose on outer surface.	Abundantly pilose on outer surface at least when young.
PEDICELS	Finely uncinulate-puberulent.	Uncinulate-puberulent and abundantly pilose.
CALYX	Puberulent with only moderate pilosity on lobes.	Abundantly long-pilose throughout.

AS LECTOTYPE of *Desmodium floridanum* I have chosen a specimen from Apalachicola, Florida which bears a label indicating that it was part of the collection used by Chapman in the preparation of his Flora. As noted earlier, *Desmodium floridanum* has been placed in the synonymy of *D. rhombifolium* by authors generally. It seems, however, to be a perfectly distinct species. The particular characters which separate it from *D. Fernaldii* (*D. rhombifolium* of authors generally) will be discussed under that species.

**D. Fernaldii** sp. nov., herbacea robusta; caule ad 1.3 m. alto de radice tenui ramosoque 4 dm. longo; caule ramisque teretis vel paullum angulatis, subtiliter puberulentibus et sparse vel dense uncinulato-pubescentibus; foliolis moderate uncinulato-pubescentibus et breviter pilosis, subtus pallidioribus et uncinulato-pubescentibus in nervo medio et venis, superficie plus minusve glabra, apice obtuso vel acuto, basi cuneato vel rotundato, (4.5–)6–8(–9.3) cm. longis, 2.5–5 cm. latis; foliolis lateralibus ellipticis vel ovato-ellipticis, saepe in apice acutis et in basi truncatis, 4–6 cm. longis et 1.8–3.5 cm. latis; stipulis lanceolato-attenuatis, striatis, pilosis, mox deciduis, 2–4 mm. longis; stipite lomenti 2.5–4 mm. longo; lomento 1–5-articulato, articulis uncinulato-pubescentibus omnino, plus minusve deltoideis,

suturo superiori leviter anguloso, inferiori obtuso, 5.5–8 mm. longo, 3.3–5 mm. lato.—*Desmodium rhombifolium* sensu auth. generally, not Ell. *Meibomia rhombifolia* sensu Vail in Bull. Torr. Bot. Cl. xix. 113 (1892) excl. syn. cit. *D. floridanum* Chapm. *D. laevigatum* sensu Torr. & Gray, Fl. N. Am. Suppl. to vol. i. 695 (1840), not Nutt.—Sandy woods, se. Va. to S. C., La., and Newton Co., Tex.

VIRGINIA: NO FURTHER LOCALITY: *Rugel* (G, annotated by Gray as *D. laevigatum*  $\beta$ . *rhombifolium*). NORFOLK CO.: North-west, Sept. 6, 1893, A. A. Heller, no. 1348. NANSEMOND CO.: dry sandy pine woods near Baines Hill School southwest of Cypress Chapel, Sept. 17, 1937, *Fernald & Long*, no. 7470; dry white sand of pine-barrens, east of Cox Landing, south of South Quay, Aug. 27, 1939, *Fernald & Long*, no. 11055 (G, TYPE); rich sandy oak and hickory woods above Nansemond River, east of Cahoon Pond, northwest of Suffolk, Sept. 12, 1941, *Fernald & Long*, no. 13626. ISLE OF WIGHT CO.: sandy pine and oak woods south of Zuni, Aug. 24, 1936, *Fernald & Long*, no. 6613. KING WILLIAM CO.: sandy oak woods southwest of Aylett, July 31, 1941, *Fernald & Long*, no. 13361. SOUTHAMPTON CO.: dry sandy open pine and oak woods 6 to 7 miles south of Franklin, July 19, 1938, *Fernald & Long*, no. 8728; border of dry sandy woods, Mars Hill Church, Aug. 21, 1938, *Fernald & Long*, no. 9067.

SOUTH CAROLINA: BERKELEY CO.: dry soils, Santee Canal, Sept., *H. W. Ravenel* (G, a unifoliolate form).

FLORIDA: WITHOUT FURTHER LOCALITY: *Chapman*, no. 188 (NY). ALACHUA CO.: dry knoll under *Quercus falcata* at Planera Hammock, Gainesville, Sept. 27, 1945, *West & Arnold* (Fla.).

LOUISIANA: WITHOUT FURTHER LOCALITY: *Hale* (G, annotated as *D. laevigatum*  $\beta$ . *rhombifolium* by Gray; NY).

I am happy to name this species, abundant in southeastern Virginia, for Professor Merritt Lyndon Fernald whose intensive work on the flora of that state has clarified many floristic problems of long standing.

The distinguishing characters between *D. floridanum* and *D. Fernaldii* are here summarized:

	D. FLORIDANUM	D. FERNALDII
INFLORESCENCE	Little or not at all branched, naked.	Much branched.
LEAFLETS	Under surface mostly soft-pilose between lateral veins.	Under surface essentially glabrous between chief lateral veins.
STIPULES AND STIPELS	Long-persistent.	Early deciduous.
ARTICLES OF THE LOMENT	Curved on upper suture.	Mostly angled on upper suture.

**D. LAEVIGATUM** (Nutt.) DC. Suffrutescent; the mostly terete stem lineate, (glabrous to) finely and minutely puberulent; leaves trifoliolate, stipulate, petiolate; stipules apparently very early-deciduous, only scars seen; stipels linear-lanceolate, puberulent on both surfaces, 1–3 mm. long; the glabrous to uncinulate-puberulent petioles angular or sulcate on adaxial surface, 1.8–6.6 cm. long; rachis similar, 1.1–2.8 cm. long; petiolules usually rugose, (glabrescent to) densely uncinulate-puberulent, 2.5–3 mm. long; the ovate-acute to more or less acuminate terminal leaflets mucronulate, rounded to acute at base, 4.3–8.4 cm. long, 2.8–5.2 cm. wide; the elliptic-oblong or -ovate lateral leaflets obtuse at apex, truncate or rounded at base, 3.2–7.4 cm. long, 2.5–4 cm. wide; upper surface of leaflets glabrous to sparsely puberulent, venation distinct because lighter in color than leaf-tissue, lower surface glabrous to sparsely puberulent or short-pilose, mostly on the midrib and chief lateral veins, margins becoming revolute, somewhat ciliate at base; inflorescence axillary and terminal, its rachis terete to angled, finely lineate, uncinulate-puberulent; primary bracts ovate-acuminate, striate, puberulent on both surfaces, 3–3.5 mm. long; secondary bracts slenderly ovate-acuminate, puberulent, ciliate, 1–2 mm. long; pedicels slender, lax, uncinulate-puberulent, 10–19 mm. long; calyx puberulent throughout, appressed pilose on the lobes and with finely ciliate teeth, the central tooth of lower lobe 3.5–4.5 mm. long, lateral teeth 2.5–3.5 mm. long, the upper bifid lobe 2.5–3.5 mm. long; corolla about twice as long as calyx; standard obovate, retuse to entire, cuneate at base, 7–9.5 mm. long, 4.5–7 mm. wide; wings semielliptic to oblong, short-unguiculate, somewhat to scarcely auriculate, 6.5–10 mm. long, 2–3.5 mm. wide; keel-petals more or less falcate, narrowed to a slender claw, apex truncate, 7.5–9 mm. long, 2–3 mm. wide; loment stipitate, 2–5-articulate; stipe mostly glabrous, 6–6.5 mm. long; articles more or less rhomboidal, reticulate, uncinulate-puberulent, 5–7 mm. long, 3.5–4 mm. wide.—Prod. ii. 329 (1825). *Hedysarum laevigatum* Nutt., Gen. ii. 109 (1818). *Meibomia laevigata* (Nutt.) O. Ktze., Rev. Gen. i. 198 (1891). *D. rhombifolium* (Ell.) DC., var.  $\beta$ . Torr. & Gray, Fl. N. Am. i. 361 (1840). *D. laevigatum* (Nutt.) DC., var.  $\beta$ . *monophyllum* Wood, Cl.-Bk. Bot. 308 (1861). *Meibomia laevigata* (Nutt.) O. Ktze., var. *monophylla* (Wood) Vail in Bull. Torr. Bot. Cl. xix. 112 (1892) in synonym. The combination actually made by Vail is incorrectly attributed by her to Wood (who described the variety under *Desmodium*) and the reference given to Wood's place of publication (Bot. & Fl. 1870) is not the earliest one.—Dry sandy woods and clearings, N. Y. to Ind. and Mo., s. to n. Fla., Tenn., La. and e. Tex.

NEW YORK: SUFFOLK CO.: Manorville, L. I., Sept. 5, 1878, *H. W. Young* (US); Manor[ville?], Aug. 26, 1872, *E. S. Miller*.

NEW JERSEY: NO FURTHER LOCALITY: *Nuttall* (Phila, ISOTYPE; G, photo). ATLANTIC CO.: sandy clearing in pine barren woods, Hammonton, Sept. 4, 1917, *A. Gershoy*, no. 362. GLOUCESTER CO.: Swedesboro, Aug. 20, 1895, *C. D. Lippincott*, s. n.

PENNSYLVANIA: NORTHAMPTON CO.: Chestnut Hill, Easton, Sept. 5, 1894, *T. C. Porter*. PHILADELPHIA CO.: woods, East Fairmount Park, Philadelphia, Sept. 24, 1875, *Redfield*, no. 4246 (Mo). BERKS CO.: unused trolley line  $\frac{1}{2}$  mile sw. Klapperthal, ca. 100 m. alt., Oct. 4, 1940, *Berkheimer*, no. 2358.

MARYLAND: WICOMICO CO.: common in *Pinus Taeda* forests near Salisbury, Sept. 20, 1914, *Tidestrom*, no. 7438; Salisbury, July, 1887, ex hb. *Canby*. BALTIMORE CO.: sandy soil in clearing, Sept. 17, 1908, *J. R. Churchill*.

VIRGINIA: NORTHAMPTON CO.: dry pine woods east of Eastville, Oct. 12, 1935, *Fernald & Long*, no. 5325. PRINCESS ANNE CO.: dry pine woods, Macon's Corner, Sept. 21, 1933, *Fernald & Long*, no. 2829 and Sept. 8, 1935, no. 4898. NANSEMOND CO.: dry white sand of pine barrens, east of Cox Landing, south of South Quay, Aug. 27, 1939, *Fernald & Long*, no. 11056. SUSSEX CO.: dry white sand of woods and clearings near Chub, Sept. 20, 1940, *Fernald & Long*, no. 12677. GREENSVILLE CO.: low clearing along Quarrel's Creek, below Pair's Store, Sept. 14, 1944, *Fernald (& J. B. Lewis)*, no. 14714. FAUQUIER CO.: woods near High Point north of Beverly, western slope of Bull Run Mountains, Sept. 29, 1935, *Allard*, no. 981. BEDFORD CO.: Sept., 1871, *A. H. Curtiss*.

NORTH CAROLINA: MOORE CO.: piney woods, Pinehurst, Aug. 21, 1897, *O. Katzenstein*. BUNCOMBE CO.: dry woodlands, Biltmore, Sept. 10, 1898, *Biltmore Herb.*, no. 1170a (G; Mo).

SOUTH CAROLINA: GEORGETOWN CO.: pine-barren clearing, 5 miles south of Georgetown, Sept. 9, 1939, *Godfrey*, no. 8120.

GEORGIA: CLARKE CO.: dry woods, Athens, 210 m. alt., June 20, 1900, *R. M. Harper*, no. 12. JASPER CO.: Monticello, Jasperly, 1848, *T. C. Porter*.

FLORIDA: DUVAL CO.: Jacksonville, 1833, *Drummond*. ALACHUA CO.: dry knoll under *Quercus falcata* at Planera Hammock, Gainesville, Oct. 7, 1945, *Arnold* (Fla); on dry cleared scrub-oak land near Hogtown Creek and Newberry Road, west of Gainesville, Oct. 17, 1945, *West & Arnold*, no. 1 (Fla).

INDIANA: BROWN CO.: old hilltop field, Cornus Ridge 5.5 mi. ne. Nashville, Sept. 11, 1941, *Friesner*, no. 16353. LAWRENCE CO.: open black-white oak ridge, 2 miles sw. Bryantsville, Aug. 16, 1934, *R. M. Kriebel*, no. 2643.

TENNESSEE: rocky woods, Chilhowee Mts., ca. 660 m. alt., Sept., *A. H. Curtiss*, no. 620. DAVIDSON CO.: vicinity of Nashville, *Gattinger*.

MISSOURI: REYNOLDS CO.: head of ravine above Kelley (Cook) Spring, 2 mi. south of Oates, between West Fork and Centerville, Sept. 22, 1935, *Steyermark*, no. 19770 (Mo).

ARKANSAS: DREW CO.: ridge woods, Monticello, 80 m. alt., Sept. 12, 1937, *Demaree*, no. 16220 (G, this collection should be checked in other herbaria, there seems to be a mixture). BRADLEY CO.: low wooded ridges, Jersey, ca. 33 m. alt., Sept. 18, 1938, *Demaree*, no. 18333. GARLAND CO.: low rocky hills above proposed dam across Ouachita River, Cedar Glades, ca. 140 m. alt., Aug. 28, 1939, *Demaree*, no. 20454. POLK CO.: low rocky hills, Shady Lake, Shady, 400 m. alt., Aug. 12, 1937, *Demaree*, no. 15697, p. p.

LOUISIANA: NO FURTHER LOCALITY: *Hale*.

TEXAS: NO FURTHER LOCALITY: *Wright*. HARRIS CO.: Houston, Aug., 184—, *Lindheimer*. DALLAS CO.: sandy woods, rare, Sept., 1874, *Reverchon*.

In their Flora of North America (p. 361) Torrey & Gray quote Nuttall's description of *D. laevigatum* in its entirety and state that they have not seen specimens. In the Supplement (p. 695) however, the authors say:

10. *D. laevigatum* (Nutt.) proves, from the examination of an original specimen, to be the same with *D. rhombifolium*. Our notice of *D. laevigatum* should therefore be erased and the name adopted in place of *D. rhombifolium*.

There is in the Gray Herbarium a specimen (Louisiana, *Hale*) annotated by Dr. Gray: "*D. rhombifolium*  $\beta$ . Fl. p. 361 *D. laevigatum*, *suppl.*"; this specimen is good *D. laevigatum*, a little larger in all its parts than the isotypic material of Nuttall's species which is at hand, but otherwise perfectly comparable. Elliott's type of *H. rhombifolium* is, on the other hand, not at all identifiable with *D. laevigatum*.

#### C. THE DESMODIUM PANICULATUM COMPLEX

In most recent treatments there has been no question at all concerning the identity of *D. paniculatum*. The two varieties of it described by Torrey & Gray have either been applied to the extremes or ignored. An earlier variety described by Desvaux (under *Hedysarum paniculatum*) and transferred to *Meibomia paniculata* by Schindler, included (in his sense) a large portion of the material previously treated as *D. Dillenii* as well as *D.*

*glabellum*. I shall consider first *D. paniculatum* and then the other members of the group.

DESMODIUM PANICULATUM (L.) DC. Prod. ii. 329 (1825), var. **typicum**. *Hedysarum paniculatum* L. Sp. Pl. 749 (1753). *Meibomia paniculata* (L.) Ktze. Rev. Gen. 198 (1891). *D. paniculatum*, [var.] *β. angustifolium* Torr. & Gray, Fl. N. Am. 364 (1840). *M. paniculata*, var. *angustifolia* (Torr. & Gray) Vail, Bull. Torr. Bot. Cl., xix. 112 (1892). *M. angustifolia* (Torr. & Gray) Kearney, Bull. Torr. Bot. Cl., xx. 481 (1893), not (HBK.) Ktze. *M. paniculata*, var. *Chapmani* Britton, Mem. Torr. Bot. Cl. v. 204 (1894).

Linnaeus's *Hedysarum paniculatum* was based on a Clayton plant in the Gronovian Herbarium (British Museum, Nat. Hist.). From the photograph in the Gray Herbarium it is clear that the leaflets are of the narrower type (at least on upper portions of the plant), a terminal leaflet being only 7 mm. broad at base. In other characters there is no difference between the broad- and narrow-leaved plants. There is, on the other hand, such complete gradation from one extreme to the other that they are best kept together as the somewhat polymorphic var. *typicum*.

Torrey & Gray's variety "*β. angustifolium*: leaves all narrower" from "Southern and Western States!" has no more validity, so far as I can see, than their var. *pubens* discussed below. It is typical *D. paniculatum*.

There are a few other individual specimens which differ in loment-characters from typical *D. paniculatum*, but lack of sufficient material or adequate information about the material at hand makes me hesitate to treat them as an entity of real taxonomic significance.

In the hope, however, that collectors will watch for such peculiar specimens I cite here the most outstanding. Two specimens with elliptic to only obtusely angled loment-articles and very broad isthmi: INDIANA: KNOX CO.: sandy soil along railroad, ½ mi. south Oaktown, Sept. 11, 1934, *Friesner*, no. 7922. NEBRASKA: THURSTON CO.: Missouri River bottoms, Winnebago Indian Reservation, Aug. 9, 1941, *W. B. Fox*, s. n.

Two specimens with fruit approaching that of *D. ciliare*, but with habit- and pubescence-characters of one of the phases of *D. paniculatum*: RHODE ISLAND: PROVIDENCE CO.: Providence, *S. T. Olney*. TENNESSEE: COCKE CO.: within three miles of Wolf Creek Station, Aug. 31, 1937, *Kearney*, no. 659 (US).

Var. **epetiolatum**, var. nov. A var. *typica* differt foliis sessilibus vel brevipetiolatis; articulis lomentorum rotundatis.—*D. paniculatum*, var. *pubens* sensu most authors.—Sphagnous bogs, damp clearings and sandy pine- and oak-woods, Coastal Plain of se. Va. and e. N. C.; Colorado Co., Tex.

VIRGINIA: ISLE OF WIGHT CO.: sandy pine- and oak-woods south of Zuni, Aug. 24, 1936, *Fernald & Long*, no. 6615. NANSEMOND CO.: dry sandy pine-woods near Baines Hill School, southwest of Cypress Chapel, Sept. 17, 1937, *Fernald & Long*, no. 7471 (G, TYPE); white sand of pine- and oak-woods and clearings near Cathole Landing, west of Factory Hill, Aug. 23, 1940, *Fernald & Long*, no. 12678 $\frac{1}{2}$ . NORFOLK CO.: Northwest, Sept. 6, 1893, A. A. Heller, no. 1255; damp old clearings and thickets, eastern side of Great Dismal Swamp, north of Wallaceton, Sept. 4, 1941, *Fernald & Long*, nos. 13630 and 13631. PRINCESS ANNE CO.: open sands back of dunes, Rifle Range, south of Rudy Inlet, Sept. 6, 1935, *Fernald & Long*, no. 4901. GREENSVILLE CO.: sphagnous bog about 1 mile northwest of Dahlia, Aug. 20, 1938, *Fernald & Long*, no. 9072.

NORTH CAROLINA: BEAUFORT CO.: pineland near Chocominty, July 20, 1938, *Godfrey*, no. 5408. COLUMBUS CO.: pine-woodland near Nokina, Aug. 29, 1938, *Godfrey*, no. 6354. ROBESON CO.: dry open sand-barrens, 14 miles southeast of Lumberton, July 4, 1927, *Wiegand & Manning*, no. 1591.

TEXAS: COLORADO CO.: 1 mile east of Weimar, Oct. 4, 1937, *Cory*, no. 25086.

Most of the material here designated as the new var. *epetiolatum* had previously been named, with more or less doubt, var. *pubens* Gray. Var. *pubens*, however, does not seem to me to be a tenable variety. Gray described it in the following manner:

“*γ. pubens*: stem puberulent; leaves oblong-lanceolate, rather rigid, pubescent, especially beneath.”

with the citation:

“*γ. Tampa Bay*, Florida, *Dr. Burrows*!  
*Western Louisiana*, *Dr. Hale*!”

The two cited specimens are before me and they are not the plants with short-petiolate leaves and more or less broadly obtuse leaflets which have been quite generally called var. *pubens*, but rather the more pubescent extreme of *D. paniculatum*, var. *typicum* which is scarcely worthy of a name. The specimens which Gray cited are not whole plants, simply the uppermost

portion of stem with inflorescence. This accounts for the somewhat shorter petioles but these are no shorter than those similarly placed in plants of var. *typicum*.

Another group of plants which has been called var. *pubens* has the general aspect and superficial characters of var. *epetiolatum*, but with angular loment-articles as in var. *typicum*. It forms, in general, a group of somewhat more inland range than var. *epetiolatum*, but at present does not seem to constitute a unit sufficiently distinct morphologically or geographically from the typical state to be specially designated. Further field-studies may bring to light critical characters which will warrant segregation of these plants.

*Desmodium Dillenii* Darlington has been perhaps the least clearly understood species of the genus in our flora. It was based by Darlington on a series of specimens representing two different elements, both of which were incorporated by him in his description. Two of the specimens from Darlington's herbarium have short petioles (to 3.3 cm.) and obtuse leaflets, two others have long petioles (up to 7 cm.) and leaflets nearly acute. The Dillenian plate to which Darlington refers is a very crude drawing which could not with certainty be referred to any of our species, the only significant character which may be observed in it being short-petiolate leaves. In view of Darlington's own confusion and the perplexity of botanists ever since concerning his species I propose to reduce the name (as I have *D. rhombifolium*) to the status of *nomen confusum* and divide the composite into its distinct elements. The first of these, that with obtuse leaflets and shorter petioles, is *D. glabellum* (Michx.) DC., while the second, with acute leaflets and long petioles I am calling *D. perplexum* sp. nov.

Schindler reduced *D. glabellum* to *Meibomia paniculata*, var. *obtusata* (Desv.) Schindl. but *D. glabellum* seems to me too well defined for that disposition. In addition to the characters already mentioned the usually retuse leaflets with prominently reticulate venation are very characteristic. *D. perplexum*, on the other hand, has thinner leaflets usually more abundantly pilose and with little or only obscure reticulation.

*D. perplexum* sp. nov., herbacea; caule tenui vel robusto, uncinulato-puberulenti, fere piloso, 6 dm. longo de radice crasso

1 dm. longo; stipulis tenuis longo-attenuatis, persistentibus; petiolis et rhachibus foliorum pilosis; foliolis elliptico-ovatis vel ovatis praecipue acutis, undique pilosis; rhachibus inflorescentiae uncinulato-puberulentibus et moderate pilosis; pedicellis 1 cm. vel minus longis; lomentis stipitatis, 2-5-articulatis; articulis plus minusve rhomboideis, uncinulato-puberulentibus.—*D. Dillenii* Ell. in part (excl. plants with obtuse reticulate leaflets).—Sandy woods, centr. Me. to Wisc. and s. rather generally throughout our range and beyond.

Because of its wide distribution and the enormous number of collections in all herbaria I shall not now, except for the type, cite specimens of *D. perplexum*. This will be done, however, in the monographic treatment, where a map of the distribution of the species will also be presented.

TYPE: VIRGINIA: SUSSEX CO.: thicket bordering Bryant Pond, about  $\frac{1}{2}$  mile ne. of Waverly, Sept. 13, 1945, *Fernald & Long*, no. 14937 (G).

*D. HUMIFUSUM* (Muhl.) Beck, the remaining member of this group has not been much recognized since its description. Specimens of it have at various times been identified as *D. ochroleucum*, *D. glabellum* and various other species. It is a spreading (though stiff) plant with often broad, abruptly attenuate stipules and broad leaflets. Its leaflets are much thinner, less coriaceous and usually narrower, however, than those of *D. ochroleucum*, its flowers very much smaller, pedicels shorter and its lomentis with more numerous, smaller articles uncinulate-puberulent throughout (rather than glabrous except on sutures) and with margins not folded. From *D. glabellum* *D. humifusum* differs in its prostrate habit, thinner leaflets and broader and longer persistent stipules among other characters. Its distribution is much more local than that of *D. glabellum*.

SIDELIGHTS FROM ZOOLOGY ON BOTANICAL  
NOMENCLATURE<sup>1</sup>

LLOYD H. SHINNERS

IN a recent article ("Official Plant Names?" in *RHODORA* **52**: 1-7, 1950), Dr. F. R. Fosberg has discussed some of the implications in efforts to add a list of conserved names of species to the rules of botanical nomenclature. His discussion is in accord with an earlier one by Dr. Albert C. Smith ("A Legislated Nomenclature for Species of Plants?" in *Amer. Journ. Bot.* **36**: 624-626, 1949). Dr. Fosberg remarks, "One of the most inevitable evils that would arise under such a scheme would be an attempt to substitute decision by authority for taxonomic research. . . . Under even the best-informed authority this would be an intolerable infringement of freedom of research." He adds further, "In repeated conversations with non-taxonomic users of botanical names it has become very evident that the annoyance with name changes is an indiscriminate one. . . . There is sometimes resentment even of cases resulting from increased taxonomic knowledge. . . . There are matters that cannot be settled by legislation any more than the principles of genetics can be regulated by the decisions of political commissars."

Systematic botanists are generally unaware of how far their zoological brethren have gone toward the acceptance of authoritative (in the sense of dictatorial, not of specially competent) and arbitrary decisions by a handful of individuals. It may seem strange to botanists that an 18-man Commission (the number now to be increased) is empowered to abrogate ("suspend") the zoological rules altogether at any time for any specific item, to exclude certain publications from consideration, or to designate types of genera and higher groups without simultaneous taxonomic study. Those who have a nodding acquaintance with such small and taxonomically rather simple groups as the birds or mammals are likely to have an illusory impression that systematic zoology is stabilized and orderly, in very favorable contrast with the condition of systematic botany, and are apt to attribute this to the rules of nomenclature rather than to the

<sup>1</sup> Space subsidized by the author to insure immediate publication.

subject matter. It is worth citing an example from the invertebrates, in which complications equal to any in botany have arisen, and have been aggravated by an authoritative ruling. V. S. L. Pate, in "The Generic Names of the Sphecoid Wasps and Their Type Species (Hymenoptera: Aculeata)" (Memoirs of the American Entomological Society No. 9, 1937), has the following discussion of the typification of *Sphex* Linnaeus (l. c., pp. 83-85):

"As type of the Linnaean genus *Sphex*, Latreille in 1810 proposed *Sphex flavipennis* Fabricius, 1793, a species not described until five years after Linnaeus' death. Nevertheless, in spite of this, the name *Sphex* was used almost uniformly in the sense of Latreille for nearly a hundred years until [Henry Torsey] Fernald in 1905 called attention to this error, discussed it at some length, [and] designated *Sphex sabulosa* Linnaeus, 1758 as type of *Sphex* Linnaeus, 1758, a decision with which the International Commission on Zoological Nomenclature concurred in rendering Opinion 32. . . . *Sphex* Linnaeus, 1758 thereby became isogenotypic with *Ammophila* Kirby, 1798, which fell as an absolute synonym and *Chlorion* Latreille, 1802, as the next oldest name in the group, was resurrected to be used for *Sphex* Auctt. nec Linnaeus. Recently the Commission while still of the opinion that *Sphex sabulosa* Linnaeus is the type of *Sphex* Linnaeus, 1758, but likewise, as a result of representations brought before them, presumably convinced that strict application of the rules in this case might apparently cause greater confusion than uniformity, proposed to suspend the rules and recognize as valid Latreille's designation of *Sphex flavipennis* Fabricius, 1793 as the type of *Sphex* Linnaeus, 1758. If this course is followed, the name *Sphex* reverts to the group . . . which has laterly been known as *Ammobia* Bilberg, 1820. *Ammophila* Kirby, 1798, is then resurrected for *Sphex* in the sense of Linnaeus and Fernald. However, as an immediate corollary of this proposed action, *Sphex*, as the Commission now advocates that it should be used, must be accredited to Latreille, presumably 1810, for only by the most specious sophistry may the name still continue to be attributed to Linnaeus. Moreover, *Sphex* Latreille nec Linnaeus, 1758, is a homonym, no matter how the case is reviewed, and as such, is invalid. Its validity is entirely dependent upon the dubious authority of a commission whose personnel must inevitably change from time to time. There is no guarantee that future commissions will not abrogate the proposed decision as readily as the present body now proposes in effect to annul that of its predecessor. It is needless to point out further the absurdity of following the procedure which the commission now proposes to advocate, that by this action they tend to vitiate such powers as they have, that in effect they nullify all preceding opinions and tend to destroy the foundations upon which the Zoological Code is founded. Their abject capitulation to the plea of temporal expediency in this instance is most certainly ill advised. Four or five decades ago the vertebrate zoologist underwent the same nomenclatorial travail that the entomologist is now undergoing. The mammalogist, the ornithologist, and the remaining vertebrate confraternity have apparently survived this period of labour. The entomologist, however, is fast approaching that condition which will soon permit him to be classed as one of those animals which are his chief concern."

Surprising though it may seem to many, botanists have grounds for pride in the history of the development of their rules of nomenclature, which have been more extensively worked out and more universally accepted for a longer time than those of the zoologists. Not until 1905 were the zoologists able to publish an international set of rules of nomenclature, and the present Code, which must serve the vast fields of entomology and protozoology as well as vertebrate zoology, amounts to only 35 articles. Contrast this with the botanical rules, whose adoption in 1905 in more or less their present form had been preceded by nearly forty years of publication and wide acceptance of two major sets of rules, and which at present include 74 articles, together with numerous recommendations, examples, and appendixes. The interested reader is referred to "A Discussion on the Differences in Observance Between Zoological and Botanical Nomenclature. 2. The Case for the Zoologists," by Francis Hemming (Secretary of the International Zoological Commission), Proc. Linn. Soc. London **156**: 134-137, 1944. The zoological Code is reprinted in "Procedure in Taxonomy," by Edward T. Schenk and John H. McMasters, revised edition, published in 1948 by Stanford University Press. (This book deals only with systematic zoology, primarily the field of paleontology, and not with the broad subject of taxonomy as the title implies.)

Botanists have perhaps some grounds for comfort in knowing that the zoological rules are now in process of more drastic revision than the botanical ones have seen in more than a third of a century. (See "Important Advances in Zoological Nomenclature Achieved at 13th International Congress of Zoology," by Francis Hemming, Science n. s. **108**: 156-157, Aug. 13, 1948.)

Botanists may be surprised by certain of the autocratic requirements in the zoological code regarding orthography. Article 3 states, "The scientific names of animals must be words which are either Latin or Latinized, or considered and treated as such in case they are not of classic origin." Nevertheless, Article 20 states, "In forming names derived from languages in which the Latin alphabet is used, the exact original spelling, including diacritic marks, is to be retained. Examples: . . . *möbiusi*, . . . *čžžeki*, . . . *färöensis*." In partial contradiction, a recommendation under this same article reads, "In proposing

new names based upon personal names which are written sometimes with ä, ö, or ü, at other times with ae, oe, and ue, it is recommended that authors adopt ae, oe, and ue." A lengthy Appendix F to the Code "indicates the manner in which Greek words should be transliterated." But this legislative gesture of acquiescence in good scholarship is counteracted by Article 14c, paragraph 3: "If the name is a modern patronymic, the genitive is always formed by adding, to the exact and complete name, an *i* if the person is a man, or an *ae* if the person is a woman, even if the name has a Latin form. . . . Examples: . . . *möbiusi*, . . . *bosi* (not *bovis*), *salmoni* (not *salmonis*)." To a botanist with even a smattering of Latin, it would appear that zoologists are compelled to illiteracy by legislative fiat—and by quite inconsistent regulations at that.

Botanists may find it strange also that names of subgenera are treated as of equal value (and are frequently used interchangeably) with those of genera, and of subspecies with those of species—going beyond a peculiarity of the American Code long since abandoned by botanists. Up to the present, there has been no provision in the zoological rules for names of groups below the rank of subspecies—a fact often overlooked by botanists who desire to substitute the term subspecies for variety in botanical nomenclature. (Provision for subspecific groups is to be added to the next edition of the zoological rules.) Those who believe that zoologists never capitalize specific names may be surprised by Article 13: "While specific substantive names derived from names of persons may be written with a capital initial letter, all other specific names are to be written with a small initial letter. Examples: *Rhizostoma Cuvieri* or *Rh. cuvieri*, *Francolinus Lucani* or *F. lucani*."

I hope that the above example and quotations will suggest to botanists the unwisdom of pinning hopes for progress upon dictatorial regulations, or of attempting to modify the botanical rules after the model of the zoological ones, without understanding the history of and present practice under the latter. The zoologists long ago adopted an official list of generic names, to which names of species are now to be added. The present state of systematic entomology is far behind that of systematic botany, as might be expected from the enormously large number of species

of insects, and the relatively small number of monographers working on them. The troubles which led to Pate's angry protests, quoted above, are very possibly a forerunner of many more likely to confront the entomologists because of the Official List and other features of the zoological rules. Surely there is much food for thought in Dr. Fosberg's remark that in the botanical rules the principle of priority and the type method "are the only fundamentally objective features in the rules of nomenclature, and are the bulwarks standing between an orderly and understandable system and nomenclatural anarchy." Botanists will do well to drop their legendary inferiority complex (wholly unjustified by their accomplishments in systematics), and follow closely the spirit of Article 6 of their rules (quoted almost word for word in Article 1 of the zoological code): "Botanical nomenclature is independent of zoological nomenclature." The zoologists have adopted arbitrary rules, then permitted a group of individuals to suspend them as occasion arises. The results have not been altogether happy. Botanists may well heed Dr. Smith's admonitions against what is likely to be "an impractical solution of a problem which is approaching clarification by the normal procedures of careful monographic and bibliographic work in plant taxonomy."

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## RANGE-EXTENSIONS AND -CLARIFICATIONS IN NEW HAMPSHIRE

A. R. HODGDON AND STANLEY KROCHMAL

It seems advisable to record range data for a miscellaneous assemblage of New Hampshire species of vascular plants collected by the authors or brought to their attention during recent years.

### 1. *RANUNCULUS FASCICULARIS* Muhl.

On May 15, 1948, the senior author and K. W. Woodward collected this buttercup near the summit of the middle member of the Pawtuckaway Mountains in the township of Nottingham. The habitat was a warm southern slope dominated by *Carya ovata* and *Ostrya virginiana*—the elevation somewhat more than

700 feet. The species has been reported previously from New Hampshire but specimens of it are difficult to locate. F. W. Batchelder<sup>1</sup> listed it with the accompanying notation "rare" and H. G. Jesup<sup>2</sup> reported it from "North Charlestown—Dr. Graves". The Reverend H. J. Sheehan O.S.B. of St. Anselm's College who has made an exhaustive study of the Batchelder Herbarium reports that he has failed to find there a specimen of *Ranunculus fascicularis*. However, the earlier collections of Batchelder were destroyed by fire in 1902 and apparently he did not succeed in replacing all of these before his death in 1911. As the species has not been reported from Maine<sup>3</sup> or farther to the Northeast<sup>4</sup>, the new station would seem to have particular significance as a northeastern extension of range.

## 2. CHIMAPHILA MACULATA (L.) Pursh.

On October 20, 1948, a class in Botany from the University of New Hampshire, while exploring a deciduously wooded southern slope in Lee, near Turtle Pond, found a few scattered plants of the attractive spotted wintergreen. The member of the group to have first noticed its variegated foliage among the fallen hickory leaves was Mr. Francis Fay.

In the second edition of Jesup's Flora, 1891, there appears the following note relating to *C. maculata* "growing with *C. umbellata*." This may refer to Vermont for which there are several accepted printed records. A more definite N. H. report is that of Walter Deane<sup>5</sup> who states that an herbarium specimen had been seen from New Hampshire. On August 31, 1929, the Reverend H. J. Sheehan collected *Chimaphila maculata* in a pine-grove in Goffstown, Hillsboro Co., along the Piscataquog River. In 1948 this station was revisited but camps had been erected and according to Sheehan's report "the search was fruitless". Recently the senior author located a specimen of *C. maculata* in the Windham collection of Wm. Samuel Harris. It is possible

<sup>1</sup> Plants of Manchester, N. H. Proc. Manchester Institute of Arts and Sciences, Vol. IV, Part 2, 1909.

<sup>2</sup> A Preliminary Catalogue of Flowering Plants and Higher Cryptogams Growing without Cultivation within 30 Miles of Hanover, 1882.

<sup>3</sup> Ogden, E. C. et al. Check-List of the Vascular Plants of Maine. Bull. of the Josselyn Bot. Soc., No. 8, Aug. 1948.

<sup>4</sup> Benson, L. A Treatise on the North American Ranunculi, Am. Midl. Nat. 40, 1, July 1948.

<sup>5</sup> Rhodora: 1, 93, 1899.

that this collection is the one referred to above by Walter Deane. It is apparent, therefore, that the spotted wintergreen is exceedingly rare in New Hampshire. Inasmuch as there are no reports of it from Maine<sup>3</sup> loc. cit. or specimens in our herbaria from areas farther to the north and east, we may assume that it reaches the northeastern limits of its known range in Lee, New Hampshire.

### 3. *PODOSTEMUM CERATOPHYLLUM* Michx.

During the past season the junior author and his co-workers of the N. H. Fish and Game Department Waterfowl Habitat Study discovered three new stations for this species to add to those previously reported by Hodgdon and Krochmal.<sup>6</sup> These stations are as follows: Warner River, Warner, Merrimack County—where abundant; Merrimack River near entrance of brook from Pine Island Pond, Manchester, Hillsboro Co.—scattered; and Suncook River, below bridge on route 28, Barnstead, Belknap Co.—rare. In addition to the above, Prof. N. C. Fassett, in the summer of 1948, sent to the senior author specimens of *Podostemum* collected in Hillsboro on rocks exposed by low water along highway 9 near junction with 31. This is at or near the Hillsboro station reported in *Rhodora*<sup>6</sup> loc. cit.

### 4. *IVA FRUTESCENS* L. var. *ORARIA* (Bartlett) Fernald & Griscom.

This species several years ago was reported<sup>7</sup> by the senior author as new to New Hampshire. Recent field studies along the shore of Great Bay and near Portsmouth demonstrate the plant to be locally abundant. In October 1947 specimens were collected by A. R. Hodgdon and D. P. Gangi on Footman's Island in Great Bay in the township of Durham. Three new townships, all in Rockingham Co., have been added to its range by the late 1948 and early 1949 botanizings of the junior author. The specific localities are as follows: Newmarket—shore of Great Bay and Vol's Island; Newcastle—route 1, near Portsmouth; and Portsmouth—near the Newcastle Station. While it might have been expected on the eastern side of the Piscataqua River in Maine, a hasty search of the Elliot and Kittery shores in December 1948 by the junior author proved fruitless. We are finding an increasing number of localized species in southeastern

<sup>6</sup> *Rhodora*: 50, Aug. 1948.

<sup>7</sup> *Rhodora*: 46, 22, 1944.

New Hampshire which fail to "bridge the gap" between it and Maine. For some, the river itself would seem to be the barrier.

#### 5. RHAMNUS FRANGULA L.

In view of the abundance and weedy character in Durham of this otherwise infrequent shrub, it seems entirely appropriate to discuss its occurrence in New Hampshire. While it is not listed in the recent check list of the Vascular Plants of Maine<sup>3</sup>, several herbarium specimens and a number of published reports attest to its occurrence in Nova Scotia, Quebec, Massachusetts, and Connecticut. A specimen in the Herbarium of the New England Botanical Club from Dublin has been the sole record for New Hampshire.

The senior author has collected this species a number of times in wooded situations or waste-areas in Durham as well as on a partially wooded pasture slope in the township of Northumberland in Coos Co., above the Connecticut River at some distance from a habitation.

In Durham, the presence of ornamental *Rhamnus Frangula* of nearly tree-like proportions in the shrubby border of the President's house in the center of Durham village perhaps explains the source of the fruits and seeds which apparently are carried by birds to wild areas in the general vicinity. This may or may not be a weed of future importance. However, at present it is well established in Durham and is showing signs of rapid spread. Collections have been made in Durham from vigorous plants in three fairly widely separated wooded areas and in addition the species has been observed in some abundance along a Durham road in an open situation.

#### 6. CENTAUREA SOLSTITIALIS L.

It is always something of a problem to know how to treat the erratic members of the flora. Barnaby's thistle, while not an abundant weed, has been taken on two separate occasions in widely separated parts of New Hampshire and sent to the University of New Hampshire for identification, once from Claremont in Sullivan County in 1945 and again by Andrew S. Abbott in Bristol in Grafton Co., Aug. 1948. The fragments sent have been put into the University Herbarium and readily serve to permit identification. It is not known whether this species is

persisting or spreading in the state. The Bristol specimens were reported as appearing in a garden following applications of sheep manure. Apparently this species may be expected as a casual adventive in New Hampshire, as it is farther south.

7. *SILYBUM MARIANUM* (L.) Gaertn.

Ella T. Pearson of Epping, in Rockingham County sent in on October 15, 1946, a large specimen of the Lady's Thistle which had appeared as an adventive in her garden.

8. *DIGITALIS LANATA* Ehrh.

Mrs. Norma Roberts of Bristol, Grafton County, sent a specimen with the notation "two plants that came up a few feet apart in an old garden—. I have no idea where they could have come from."

Herbarium specimens of the species discussed above are variously distributed in the collections of the New England Botanical Club, the University of New Hampshire, and St. Anselm's College.

UNIVERSITY OF NEW HAMPSHIRE AGRICULTURAL EXPERIMENT  
STATION (A. R. H.) AND  
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